ABSTRACT

This invention presents a method for computing Instantaneous Frequency by applying Empirical Mode Decomposition to a signal and using Generalized Zero-Crossing (GZC) and Extrema Sifting. The GZC approach is the most direct, local, and also the most accurate in the mean. Furthermore, this approach will also give a statistical measure of the scattering of the frequency value. For most practical applications, this mean frequency localized down to quarter of a wave period is already a well-accepted result. As this method physically measures the period, or part of it, the values obtained can serve as the best local mean over the period to which it applies. Through Extrema Sifting, instead of the cubic spline fitting, this invention constructs the upper envelope and the lower envelope by connecting local maxima points and local minima points of the signal with straight lines, respectively, when extracting a collection of Intrinsic Mode Functions (IMFs) from a signal under consideration.